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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/982,557	10/16/2001	Syoichi Aoki	6920/0J938	7775

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EXAMINER	
NGUYEN, MICHELLE P	
ART UNIT	PAPER NUMBER
2851	

DATE MAILED: 08/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/982,557	Applicant(s) AOKI ET AL.	
	Examiner Michelle Nguyen	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 October 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4, 6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because it should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art. Applicant may wish to delete the last sentence of the abstract, which refers to an improvement in spatial resolution. Correction is required. See MPEP § 608.01(b).

Drawings

2. The drawings are objected to because:

(a) Under 37 CFR 1.83(a), they must show every feature of the invention specified in the claims. Therefore, the reflecting point must be shown or the feature(s) canceled from the claim(s) (see claim 1). No new matter should be entered.

(b) They fail to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign mentioned in the description: (KL) (see page 10, line 17).

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 7 is objected to because in line 4, "local beams parallel beams" should be --local beams to parallel beams--.

Appropriate correction is required.

Claim R j ctions - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,459,570 to Swanson et al.

With regard to claim 1, Swanson et al. disclose a low coherent reflectometer comprising:

a light source (source 12) (see Col. 4, lines 35-7, Col. 11, lines 47-8, Fig. 1);

a branching element (coupler 22) for branching beams output from the light source into measurement beams and local beams, wherein the measurement beams are introduced into a first optical path (first fiber optic path 26) towards a measured optical circuit (see piezoelectric crystal 40) including a reflecting point (see sample 28, probe module 34), and the local beams are introduced into a second optical path (second fiber optic path 30) including a spatial optical path (path between lens 38 and mirror 32) (see Fig. 1);

a combining element (coupler 22) for combining reflected measurement beams entering from the first optical path and reflected local beams entering from the second optical path (see Fig. 1); and

a compensator for compensating a difference between chromatic dispersions (group velocity dispersions) in the first optical path and the second optical path respectively (see Col. 5, lines 13-23).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson et al. as applied to claim 1 above, and further in view of U.S. Patent No. 5,303,079 to Gnauck et al.

With regard to claim 2, Swanson et al. do not teach explicitly the compensator according to claim 1 to comprise a dispersion shifted fiber, which is arranged within the first optical path. However, Gnauck et al. teach that it is well known in the art to use a dispersion shifted fiber for countering system limitations imposed by dispersion (see Col. 1, lines 25-8). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use as the compensator of Swanson et al. the dispersion shifted fiber discussed by Gnauck et al., the compensator being arranged within either of the optical paths such that system limitations imposed by dispersion are minimized.

8. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson et al. as applied to claims 1 above, and further in view of U.S. Patent No. 6,005,702 to Suzuki et al.

With regard to claim 3, Swanson et al. do not teach explicitly the compensator according to claim 1 to comprise an adjuster. However, Suzuki et al. teach a compensator (optical amplifier repeater 7, dispersion compensation fiber 9) comprising an adjuster (optical amplifier repeater 7) for adjusting a value of a full width at half maximum in spectrum of beams output from a light source (optical pulse transmitter 1) such that non-soliton components are removed (see Col. 4, lines 47-52, Col. 5, lines 47-56, Fig. 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use as the compensator of Swanson et al. the adjuster of Suzuki et al. for removing non-soliton components, and thereby countering effects of dispersion.

With regard to claim 4, Swanson et al. do not teach explicitly the compensator according to claim 1 to comprise an optical bandpass filter. However, Suzuki et al. teach a compensator (optical amplifier repeater 7, dispersion compensation fiber 9) comprising an optical bandpass filter (provided within the optical amplifier repeater 7) for restricting beams output from a light source (optical pulse transmitter 1) into a prescribed range of wavelengths such that non-soliton components are removed (see Col. 4, lines 47-52, Col. 5, lines 47-56, Fig. 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use as the

compensator of Swanson et al. the optical bandpass filter of Suzuki et al. for removing non-soliton components, and thereby countering the effects of dispersion.

9. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,459,570 to Swanson et al. in view of U.S. Patent No. 5,303,079 to Gnauck et al.

With regard to claim 5, Swanson et al. disclose a low coherent reflectometer comprising:

a light source (source 12) (see Col. 4, lines 35-7, Col. 11, lines 47-8, Fig. 1);

an optical coupler (coupler 22) having four ports (not numbered), wherein beams output from the light source are input to a first port (see fiber optic path 24) and are branched to produce measurement beams and local beams respectively so that the measurement beams are output from a second port (see fiber optic path 26) and the local beams are output from a third port (see fiber optic path 30), and wherein reflected measurement beams input to the second port and reflected local beams input to the third port are combined, so that combined beams are output from a fourth port (see fiber optic path 40) (see Col. 4, line 62 to Col. 5, line 4, Col. 6, lines 17-25, Fig. 1);

a reflector (lens 38, mirror 32) that is arranged to terminate a second optical path (fiber optic path 30) including a spatial optical path (path between lens 38 and mirror 32) for propagation of the local beams (see Fig. 1); and

a received light signal processor (photodetector 42) for receiving and processing the combined beams output from the fourth port of the optical coupler (see Fig. 1).

Swanson et al. do not teach a dispersion shifted fiber to be arranged within a first optical path (fiber optic path 26) between the second port of the optical coupler and a measured optical circuit (see piezoelectric crystal 40) including a reflecting point (see sample 28, probe module 34) (see Fig. 1). Instead, Swanson et al. teach a compensator for compensating a difference between chromatic dispersions (group velocity dispersions) in the first and second optical paths, the compensator arranged within either of the paths such that effects of dispersion are countered (see Col. 5, lines 13-23). However, Gnauck et al. teach that it is well known in the art to use a dispersion shifted fiber for countering system limitations imposed by dispersion (see Col. 1, lines 25-8). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use as the compensator of Swanson et al. the dispersion shifted fiber discussed by Gnauck et al., the compensator being arranged within either of the optical paths such that system limitations imposed by dispersion are minimized.

With regard to claim 6, Gnauck et al. are silent as to the length of the dispersion shifted fiber discussed above with respect to claim 5. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to fabricate the dispersion shifted fiber having any length, including a length substantially equal to a length of the spatial optical path, for countering effects of dispersion.

With regard to claim 7, Swanson et al. teach the reflector discussed above with respect to claim 5 to comprise a collimator lens (lens 38) and a reflecting mirror (mirror 32) which are spaced apart at a prescribed distance in the spatial optical path, and wherein the collimator lens converts the local beams to parallel beams, which propagate towards and are then reflected by the reflecting mirror (see Fig. 1).

10. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,459,570 to Swanson et al. in view of U.S. Patent No. 6,005,702 to Suzuki et al.

With regard to claim 8, Swanson et al. disclose a low coherent reflectometer comprising:

a light source (source 12) (see Col. 4, lines 35-7, Col. 11, lines 47-8, Fig. 1);

an optical coupler (coupler 22) having four ports (not numbered), wherein beams are input to a first port (see path 24) and are then branched to produce measurement beams and local beams so that the measurement beams are output from a second port (see path 26) and are transmitted through a first optical path (path 26) towards a measured optical circuit (see piezoelectric crystal 40) including a reflecting point (sample 28, probe module 34) and the local beams are output from a third port (see path 30) and are transmitted through a second optical path (path 30) including a spatial optical path (path between lens 38 and mirror 32), and wherein reflected measurement beams input to the second port and reflected local beams input to the third port are

combined, so that combined beams are output from a fourth port (see path 40) (see Col. 4, line 62 to Col. 5, line 4, Col. 6, lines 17-25, Fig. 1);

a reflector (lens 38, mirror 32) that is arranged to terminate the spatial optical path of the second optical path (see Fig. 1); and

a received light signal processor (photodetector 42) for receiving and processing the combined beams output from the fourth port of the optical coupler (see Fig. 1).

Swanson et al. do not teach the reflectometer to comprise an optical bandpass filter, wherein beams transmitted therethrough are inputted to the coupler. Instead, Swanson et al. teach a compensator for compensating a difference between chromatic dispersions (group velocity dispersions) in the first and second optical paths (see Col. 5, lines 13-23). However, Suzuki et al. teach a compensator (optical amplifier repeater 7, dispersion compensation fiber 9) comprising an optical bandpass filter (provided within the optical amplifier repeater 7) for adjusting a full width at half maximum in spectrum of beams output from a light source (optical pulse transmitter 1) such that non-soliton components are removed (see Col. 4, lines 47-52, Col. 5, lines 47-56, Fig. 1). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use as the compensator of Swanson et al. the optical bandpass filter of Suzuki et al. for removing non-soliton components, and thereby countering the effects of dispersion.

With regard to claim 9, Swanson et al. teach the reflector discussed above with respect to claim 8 to comprise a collimator lens (lens 38) and a reflecting mirror (mirror

32) which are spaced apart at a prescribed distance in the spatial optical path, and wherein the collimator lens converts the local beams to parallel beams, which propagate towards and are then reflected by the reflecting mirror, so that the reflected local beams are subjected to convergence by the collimator lens to produce converged beams, which are transmitted to the third port of the optical coupler (see Fig. 1).

With regard to claim 10, Swanson et al. teach the reflecting mirror discussed above with respect to claim 7 or 9 to be made movable along an optical axis to vary the distance between the collimator lens and the reflecting mirror (see Col. 5, lines 26-8, Fig. 1).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U.S. Patent No. 5,321,501 to Swanson et al.

JP 07-098264 to Takada et al.

JP 07-243939 to Takada et al.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Nguyen whose telephone number is 703-305-2771. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.

mpn
August 13, 2003

RUSSELL ADAMS
SUPERVISORY PATENT EXAMINER
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